PD-AAU-648

DEPARTMENT OF TRANSMIGRATION
PROJECT LUWU
SOUTH SULAWESI, INDONESIA

CHECCHI AND COMPANY

# FINAL REPORT

# RURAL EXTENSION CENTER

# SUB PROJECT

DECEMBER, 1983

Rural Extension Center Subproject

I. History of Agricultural Extension in Luwu Prior to Project Luwu.

There are no clear records of agricultural extension prior to the time Project Luwu began in 1975. Figures for the number of field extension workers for 1975 are not available, but the total number of staff for each agricultural sub-sector agency (e.g. Office of Food Crops, Fisheries, etc.) in 1975 are compared to the total number of staff and the total number of field extension workers in 1983 in table 1.1.

Table 1.1

| Agency | Total Staff 1975 | Total Staff 1983 | Extension Workers 1983 | % of total staff who were exten. workers 1983 |
|---|---|---|---|---|
| Food Crops | 117 | 156 | 102 | 65% |
| Estate Crops | 15 | 100 | 43 | 43% |
| Animal Husbandry | 9 | 32 | 13 | 40% |
| Fisheries | 52 | 52 | 8 | 15% |

The "North Luwu Micro-Economic Study" (Institut Pertanian Bogor, 1976) noted that in the area surveyed (Lamasi, Bone-Bone and Kalaena) there were 2 extension workers (1 Office of Food Crops Extension Agent and 1 BIMAS Field Extension Worker) for each area and that some agents had to cover more than 1 kecamatan. Each transmigration Unit also had 1 or 2 extension agents. The Office of Fisheries had very few field extension agents and the Office of Animal Husbandry had none. The same report noted that 43% of the 371 farmers surveyed during the study had had no contact at all with extension workers during the previous 5 years. The 57% which did report contact with extension staff reported that the visits occured mostly within the previous 3 years. Of the farmers who had had extension contacts 89% reported that they were satisfied with the service received and that they were most interested in receiving information about rice production, secondary crops (i.e. palawija), coconuts and livestock (in that order). They noted that of the various extension methods used they were most interested in lectures and training courses and in demonstrations. They were least interested in extension visits.

The per hectare yields of major food crops grown in Luwu reported in the N. Luwu Micro-economic Study were as follows:

Table 1.2

Reported Food Crop Yields 1975 (tons/ha)

| Area / Crop | Bone-Bone | Lamasi | Kalaena | Main Average |
|---|---|---|---|---|
| Irrigated Rice | 1.41 | 1.27 | .87 | 1.18 |
| Upland Rice | .61 | n/r | .55 | .58 |
| Maize | .80 | 1.10 | .70 | .87 |
| Soybeans | .64 | .72 | .56 | .64 |

It was noted in the study that yields in Luwu were lower than those in the rest of Indonesia, that there was no agronomic reason for this, and that fertilizer markerting and agricultural extension were the major constraints. The report went on to state that there were no signs of coordination, integration, synchronization or simplification of extenssion activities in the area surveyed.

The lack of coordinated extension was also noted in the Capital Assistance Paper (USAID 1975) and the task of improving coordination between agricultural sub-sector agencies was assigned to the Rural Extension Center (REC) Subproject. According to the Capital Assistance Paper (CAP) less than 10% of Luwu farmers were using high-yielding rice varieties or fertilizers and that no farmers were using disease resistant rice varieties.

In 1975, there were no RECs in Luwu and only 355 RECs in Indonesia. These were operated by the Agricultural Agency for Education, Training and Extension (BPLPP) and were to fulfill the following functions: 1. Disseminate current agricultural information, 2. Conduct field trials; 3. Implement good farming practices; 4. Develop farmer groups, and; 5. Hold training sessions. The RECs in Luwu were to differ from the other RECs in Indonesia in several ways.

The authors of the CAP outlined a concept whereby the Luwu RECs would be one part of 4 Farm Service Centers which were to have become "one-stop-shoping-centers" for Luwu farmers. The Farm Service Centers were to incorporate the REC and Farmer Cooperative Centers (FCCs) into one complex where a farmer could obtain technical advice, agricultural inputs, credit and marketing services all in the same visit. Before Project Luwu was implemented however, some important changes took place at the National level when the Department of Cooperatives was moved from

the Ministry of Transmigration and Cooperatives to a new Ministry of Trade and Cooperatives. As a result the Farm Service Centers were never constructed and the RECs and FCCs were established separately. In another important change at the national level affecting project Luwu the responsibility for the 355 RECs in Indonesia was transfered from BPLPP to the Directorate of Food Crops. Hence, the 4 RECs in Luwu were the only ones in Indonesia that were administratively under the Agricultural Agency for Education, Training and Extension.

Another difference was that the Luwu RECs were to serve all of the extension needs of Luwu farmers rather than only extension matters concerning food crops production or Directorate of Food Crops and BIMAS programs. In order to accomplish this task the Luwu RECs were larger (320 square meters vs. 80 square meters), included a larger farmyard (5-10 ha. vs 2 ha.), were to have more equipment (includng a jeep for each REC), and more staff (30 rather than 18 persons). Each Luwu REC was to have a university graduate for manager and each REC was to be specialized in whatever particular agricultural activity (e.g. fisheries at REC Batusitanduk, Estate Crops at REC Padang Sappa, etc.) was the predominate one in the geographic area served by that REC. The CAP implied that all field extension workers were to be administratively under the REC subproject, but this never occured. In addition to a specialized, university graduate manager, each REC was to have had 5 extension workers who were specialists in the predominate agricultural activity being emphasized at that REC. That goal was also never achieved.

Added to the normal duties assigned to all RECs in Indonesia, the 4 RECs in Luwu were to develop programs for:

1. Irrigated farming.
2. Improved upland cropping.
3. Improved rice culture and varietal improvement.
4. Improving the coordination of governmental and educational agencies assisting the Luwu project.
5. Maintaining close relationships with agriculture research agencies in order to provide the most recent information on diseaase-resistant varieties.

The Luwu RECs were also to assist in the achievement of the overall goals for project Luwu as stated in the Capital Assistance Paper. The narrative goals included in the CAP are:

1. To increase per capita income and food consumption of Luwu subsistance-level farmers; 2. To increase the movement of marketable agricultural surpluses to food deficit areas; 3. To increase agricultural production to the levels outlined in the CAP; 4. To increase the utilization of more advanced crop productioon technology (e.g. irrigation, double cropping, fertilizer, high-yielding, disease resistant varieties; increased employment and; 5. Increased interministerial coordination in planning, budgeting and implementing the rural development project.

In order to achieve the stated goals the Capital Assistance Paper provided for loan funds amounting to $1,149,375 or 45% of the $2,561,890 estimated as the 4 year construction and operation costs of the Farmer Service Centers. Of the total amount it was estimated that 46% ($1,178,469) was necessary to establish, equip and operate the Rural Extension Centers. Loan funds were to be used to pay 50% of the constructiion costs, and 100% of the training and equipment costs. The Government of Indonesia (GOI) was to pay 50% of the local construction costs and 100% of the operational costs (salaries, operations and maintenance, etc.). The amount of loan funds originally allocated to the REC subproject represented about 3 1/2% of the total loan of $15 million.

## II. REC Programs and progress, 1975-1983.

Basic REC subproject construction was completed in 1978. Each REC consisted of a classroom/office complex, 3 units of staff housing, out-buildings (cattle sheds, chicken houses, etc.) and a farmyard surroundng the buildings. Major construction and site problems were that REC Bone-Bone was the only REC which had access to irrigation, and all RECs had problems with either the quality or quantity of water available. The dormitories for each REC originally included in the CAP were not constructed from loan funds. To date only one dormitory at REC Bone-Bone has been constructed from GOI funds, but by holding village-sited training courses and by boarding participants of REC-sited training courses with local farmers, the lack or dormitories has not been a noticable handicap.

REC Batusitanduk was to have been a specialty center for fisheries, but the lack of irrigation or another source of adequate water proved something of a handicap. Since Bone-Bone is the only REC with access to irrigation a freshwater fishpond complex was constructed there from GOI funds in 1981. It has proved something of a drawback having the fishpond in Bone-Bone and the REC Manager seconded from the Office of Fisheries at REC Batusitanduk, but management of the Bone-Bone fishpond has improved in the recent past and should continue to improve as additional experience is gained. The lack of fisheries facilities at REC Batusitanduk has been overcomme through the use of Office of Fisheries facilities in the REC Batusitanduk work area and by organizing village-sited farmer training courses and demonstrations.

REC Mangkutana was poorly sited. Poor soil and an acute lack of water have resulted in the general poor condition and extremely poor staff morale at that REC. The soil at REC Mangkutana is very acid (pH levels were analyzed at between 4.9 and 5.1), has a very low micro-nutrient availability, low cation exchange capacity, a very low base saturation level, and low to very low organic matter content make the site unsuitable for general agriculture. Repeated attempts to overcome this problem by liming have yielded no results. Repeated requests for suggestions from research organizations led to some field experiements being established on the REC site by the Institute for

Food Crops Research, Maros, which produced some results (unfortunately, the experiements were ruined by wild animals before they were harvested), but the most successful test plot was one in which the natural topsoil was removed and replaced with topsoil from another site. A combination of organic and green manure plowed into the soil over a period of time might improve the condition of the soil, but the time and expense involved would probably be prohibitive. Elephant grass has been grown for the livestock at the REC, but repeated requests to keep records of production have been to no avail and it is not known if the production obtained is economical for farmers.

Problems with water in sufficient quantities has continued to plague operations at all RECs except Bone-Bone, where there is a problem with the quality of the water. Wells were too shallow, but they are currently being deepened at 3 of the RECs and it is anticipated that this will relieve the water problems at all of the RECs except Mangkutana. Several solutions have been suggested and a gravity-fed system utilizing a water source from a hill located 1,200 meters behind Mangkutan REC was proposed and after much delay and discussion, approved by USAID. However, neither BAPPENAS approval for funds for construction of the system have been received to date and it is now too late to construct a water system from loan funds. To complicate the problem still further, cost esculations which occured during the delay have made it impossible to construct a gravity-fed system with the funds originally requested. However, it appeaars to be possible to bore a deeper well with the funds requested for the gravity-fed system, if in fact such funds are ever approved and provided. Despite these and other problems the Luwu REC extension program began operations in the 1977/78 fiscal year.

Although not included in the original concept an REC headquarters complex was constructed in Palopo from funds provided by the Government of Indonesia (GOI). The Subproject Manager, Consulant and most of the PPS-level staff have all been located in Palopo. With the exception of a PPS/estate crops all of the staffing requiremens outlined in the CAP were pretty well met.

It is important to note with a very few exceptions, REC subproject staff have all been seconded from other sub-sector agencies within the Ministry of Agriculture and have not been full-time employees of BPLPP. This arrangement under which PPSs from different agricultural sub-sector agencies have been working together in a central location on one project is thought to have been the only one of its kind in Indonesia when it was first established. At the senior technical staff level the arrangement has been a notable success in the coordination of kabupaten level agricultural extension.

While there have been few problems with conflicting sub-sector agency/REC interests at the senior staff level, the same has not always been the case with field level staff. Some conflicts have resulted from the fact that individual REC Managers have been from a different sub-sector agency than the field staff

under them. This has been exacerbated by the fact that the field extension staff are not under the direct control of the REC Subproject and owe their primary allgeiance to the Office of Food Crops. Despite this handicap the REC has been able to carry on is extension program in an effective manner.

REC subproject extension activities can be divided into 4 categories: 1. Staff training; 2. Farmer training; 3. Demonstrations, and; 4. Extension communications. A total of approximately Rp 756,400,000 will have been expended for the REC subproject by the end of the 1983/84 GOI Fiscal Year. Of the total amount 73% was provided by the Goverment of Indonesia and 27% was from the loan provided by the United States of America. Sixty eight percent of the loan funds were used for field activities (i.e. staff training, farmer training, field demonstrations and farmer communications) while 21% of the GOI funds were expended for field activities. The use of field activity funds provided by the GOI has been limited to transmigration areas. These facts have important implications for the REC subproject now that all of the loan funds have been expended.

Staff Training - There have been some special staff workshop and other training activities, but most of the staff training has consisted of a bi-weekly, in-service training program for food crops extension staff at each REC. The major differences between the in-service training at Luwu RECs and the other approximately 1,240 RECs which now exist in Indonesia are: 1. Luwu RECs began generalist ("polyvalent") training for PPLs earlier; 2. A special budget for in-service training was provied under the Luwu program. 3. Training in Luwu was geared to a proritized list of farmer and extension worker problems, and; 4. A limited amount of training has been provided for field extension staff from subsector agencies other than the Office of Food Crops. Luwu REC in-service training has been scheduled so that the training being received by extension staff parallels in time the activities which farmers are conducting in their own fields at any given time. This means that PPLs are receiving training at that time they will be advising farmers about those same activities in the field. A strong practical training element has also been included in the Luwu in-service training so that by the time a PPL is ready to conduct a particular activity in the field, the PPL has had some practical experience in actually doing the work and in presenting the information to farmers.

Early in the REC Sub-project both instructor and PPL attendance at bi-weekly training sessions was very low. Funds to pay for transportation and consumption costs were provided for all participants and attendance rates improved significantly. When, due to delays in budgets or approvals, funds for participant expenses were not available, attendance and the morale of participants noticeably decreased. Fundng should be continued because the bi-weekly, in-service staff training is the most important tool available at the kabupaten level for improving the performance of agricultural extension workers.

An extremely important step in the coordination of agricultural extension was taken when senior technical staff from each agricultural sub-sector agency participated in an REC organized course entitled "Farm Management: The Whole Farm Approach". During the 2 week intensive course taught by staff from Universitas Hasanuddin and the south Sulawesi Provincial Agricultural Kanwil's Office, participants were taught to plan agricultural extension for whole farming systems rather than for individual commodities. During the course participants began work on producing recommendations for "extension packets" for the several different farming situations in Luwu. However, only a beginning was made in presenting the techniques for whole farm planning and additional funding and training are needed so that this important inter-subsector group can continue the work it has begun.

REC Subproject Farmer Training

Prior to 1980, REC Subproject Farmer Training Courses were general in nature and included training in all aspects of agriculture (i.e. food crops, animal husbandry, fisheries, estate crop /perennials). Training was theoretical and mostly consisted of classroom lectures. Due to the nature of the training courses and the amount of subject matter covered, farmer training courses lasted from one week to one month. It was reported that farmers sometimes lost interest during the course and that they retained only a small amount of the subject material that was presented. It was felt that courses of a shorter duration, with limitations on the amount of subject matter and a stronger practical training element would be more beneficial to Luwu farmers. In mid-1980 farmer training courses were limited to 3 days, one or two agricultural enterprise subjects and a strong practical training component was included. At first it was hoped that practical training plots could be organized at the RECs (both for staff and farmer training), but it proved difficult due to lack of interest by REC subproject staff in establishing and maintaining plots so that plants would be available at all key points in the production cycle of a particular field crop. The lack of irrigation at all of the RECs except Bone-Bone was a factor and the idea of planting a crop for training which might be plowed back into the soil before harvest to make way for a new crop for the next training course was quite foreign to the REC subproject staff.

In order to overcome this lack of available practical training sites and to reinforce the concept of designing farmer training courses to help farmers from a particular geographic area deal with the specific problems which they faced in their individual situations, farmer training courses were conducted at village-level sites. The problem of having practical training materials (i.e. crops) available in all of the key stages of growth was overcome by establishing a training plot for each course and having practical training days (with adequate reviews of theory beforehand) at several different key times during the course of the production cycle. Such practical field training days were conducted by PPMs or the area PPL. Even though this system does not make the most effective use of the land surround-

ing the RECs, it is a feasible answer for practical training for farmer training courses if the training plots are conscientiously maintained and supervised.

All farmer training courses conducted by the REC sub-project were done in cooperation with and the participation of staff from the agricultural sub-sector agency involved. Once a spirit of cooperation was established, there was a considerable amount of interaction between the RECs and sub-sector agencies in the designing and implementation of courses to meet specific farmer needs. Where the REC subproject did not have the personnel to conduct a particular type of course, instructors from the particular sub-sector agency involved, or in some cases from an agency outside the Ministry of Agriculture (e.g. Bank Rakyat Indonesia, Farmer Cooperative Centers, etc.) were invited to participate in the course while REC subproject staff provided support services (visual aids, practical training sites and materials, etc.). The REC subproject was also requested by other organizations to design and implement training courses to meet the specific needs of groups of farmers. In this way REC farmer training courses not only provided valuable opportunities for farmers, but they became a vehicle for increasing cooperation between the RECs and other agencies.

To date a total of 190 farmers training courses conducted from all funding sources have provided 4,685 farmers with a total of 28,061 man-days of training to Luwu farmers. A total of 19,862 man-days of training (70% of all farmer training) were conducted from loan funds at an average cost per man-day of training of Rp 3,258. Thirty percent of the total man-days of farmer training were funded from GOI funds at an average cost of Rp8,410 per man-day of training.

REC Subproject Farmer Training Courses have consistantly been given very positive evaluations by several different evaluation teams, including UNHAS, the USAID Evaluation Team and follow-up evaluations conducted by the REC Subproject and agricultural sub-sector agencies. More importantly, the farmers who participated in the courses have given very positive feedback regardng the training which they received. The 1982 UNHAS Evaluation noted that 93.5% of the (56) farmers interviewed indicated that they felt that the REC Farmer Training Courses were very effective. In a recent (December, 1983) REC subproject follow-up evaluation 97.8% of the (45) farmers and 100% of the (21) Village Leaders (Kepala Desa) interviewed reported that participants from REC training courses were using what they learned from the courses in their own day-to-day activities. Both evaluations noted that a sizable proportion of course participants (91.3% in the UNHAS Evaluation and 97.8% in the REC Evaluation) taught technology which they had learned in the REC training courses to other farmers in their villages. The REC Evaluation indicated that 82.5% of the other farmers made use of the information supplied to them by primary course participants.

The REC Evaluation also showed that participants tended to

remember what they had been taught in training courses. Three objective questions (e.g. "what fertilizer recommendation for rice was taught to you during the REC training course for rice producers?) selected from the basic goals for each type of training course were asked of the 45 farmers randomly selected for the evaluation. None of the farmers responded incorrectly to all 3 of the questions, only 3 farmers (6.7%) missed 2 of the questions, 11 farmers (24.4%) missed 1 of the 3 questions and 31 of the farmers sampled (68.9%) responded correctly to all 3 of the questions. This was somewhat surprising, even to REC subproject staff as some of the farmers in the sample had attended the training course during early 1981, 2 years before the evaluation was conducted.

REC Subproject Demonstrations

Prior to 1980 REC Sub-project (and Office of Food Crops) demonstrations tended to be result-type demonstrations where inputs were supplied to a particular farmer for a certain demonstration and the farmer would plant and maintain the crop until harvest. When the demonstration plot was harvested a group of farmers and local government officials were collected to witness the harvest and the yield from the demonstration was compared to area farmer yields. A new system of demonstrations was introduced in 1981 whereby demonstration plots combined the concepts of result and method demonstrations and a series of training days were added. The rational was to increase the benefits to local farmers by increasing the number of farmer contacts and thus the amount of information presented at each demonstration site.

The new concept for REC sub-project demonstration was to plan and present several "farm field training days" to area farmers using the demonstration site as a practical training tool. For example, at a rice production demonstration the field extension worker (PPL) would hold field training days when the seed was introduced into the seedbeed, when the basic application of fertilizer was applied and the seedlings were transplanted, when the first weeding, fertilizer top dressing and pest control measures took place and when the demonstration plot was harvested.

The first step was to plan the approximate location and time of planting the demonstration well in advance of the planting date. A checklist was produced where planned dates for ordering and delivering inputs to the REC, to the demonstration site, the amount of inputs required, and all of the other information necessary to complete the demonstration was entered. The idea was to use the checklists at REC Headquarters and the individual REC involved so that all of the demonstration activities could be monitored by entering planned dates for activities and the date the activities were completed (or were to be completed). The basic demonstration checklists were not popular with either headquarters or field staff as they were considered to be extra, unnecessary work and the basic checklists were soon abandoned. Had they not been so unpopular, they could have served as a basis for a good demonstration management and monitorng system.

The next step was to allow the individual RECs and field extension staff to select the demonstration site and the individual farmer to conduct the demonstration. Then a "padi cultivation activities" schedule sheet for the specific rice variety being used was completed by entering the approximate dates for each major activity in the rice cultivation cycle. Approximate dates for each field training day were set and a copy of the padi cultivation activities sheet was sent to the REC involved and to REC Headquarters. The real dates for field training days were set 1 or 2 weeks before they were actually held and the new information was passed up the line of communications to REC Headquarters.

During each field training day the PPLs were to collect as many area farmers as they could and first explain all of the most important steps to occur between one field training day and the next. A key point was that the PPL would select and emphasize technical information pertaining to the most important problems faced by the group of farmers gathered at that particular demonstration site. It was, of course, impossible to cover all of the necessary activities in one training day so activities to be included had to be carefully selected so that they would be the most meaningful to the farmers involved in that training day. After a verbal explaination and discussion with the group, the PPL would do a practical demonstration of the recommended cultivation procedures for the work most important to that particular group of farmers. PPLs were encouraged to include the demonstrator (where possible) as an "instructor" for the field training days. When the technology had been explained to the group of farmers and then demonstrated by the PPL or the demonstrator, the group of farmers themselves would perform the practical work on the demonstration site.

At the final farm field day when the plot was harvested local officials, REC officials and area farmers would attend demonstration harvest ceremonies. Each farmer was given a chance to estimate the yield of the demonstration plot and those whose estimate was the closest to the actual yield were presented with small prizes (e.g. a container of insecticide) at the end of the ceremony. A sample cutting was then taken from the demonstration site (and the control plot if a control was used), weighed and the results announced to the group. The demonstrator would give a brief explanation of how he obtained the yield and a poster-sized chart presenting an economic analysis of the demonstration compared with local farmer (or control plot) practices was filled out from information previously collected. The results were discussed, light refreshments served and a brief closing ceremony was conducted.

The concept proved workable and popular when conducted properly. Field extension staff were constantly encouraged to select the subject matter to be covered at field training days carefully and to prepare all of the necessary materials well beforehand so that the farmers time was not wasted. The amount of time spent

on a field training day differed from area to area depending on the skills of the PPL and the interest of the farmers. It was soon learned that farmers would simply leave if they lost interest in the proceedings. As mentioned above, the REC subproject demonstrations were backed up by in-service staff training where PPLs were taught and practiced the necessary technological skills in addition to how to present the information to the farmers.

The demonstration concept was successful and the field training days were conducted as planned. However, problems with communications between the field and REC Headquarters soon developed and have never been satisfactorily resolved. It is important that the dates of all of the field training days be communicated to REC Headquarters so that the senior training staff could observe the performance of the PPLs and determine if what was being taught during the in-service training sessions was being used by the PPLs, if it was being used correctly and if the training was relevant to the needs of the farmers and field extension staff.

Problems concerning communication became evident early in the REC subproject demonstration program and measures to improve the communications included discussions with the staff concerned, the provision of funds for sending messages from the field and an agreement whereby REC staff could use the FCC single-side band radio system were implemented, but information concerning the dates as to when field training days were to be held still did not reach REC Headquarters. Some improvement was achieved and REC Headquarters was informed of when many of the final farm field day were to be held, but information regarding the normal field training days was not received. Subsequent visits to demonstrators revealed that the training days were being conducted in most cases, but the information simply was not being conveyed to the REC subproject Headquarters before the field training days were held. In addition, reports on the demonstrations were slow in coming to REC headquarters, and were in many cases the reports were incomplete. These communications problems were exacerbated by the fact that the PPLs are not direct employees of the REC subproject. The communications problem continues to handicap the REC demonstrations and a solution to the problem must be found before it can be certain that the demonstrations (and staff training) are meeting the needs of Luwu farmers.

In light of the farmer preferences reported in the North Luwu micro-economic study, the goals in the Capital Assistance Paper, and the predominate cropping patterns, it was decided that during the trial period of the REC Subproject Demonstration System the policy would be to concentrate on rice demonstrations. Another benefit of this policy was that the PPLs had the greatest technical knowledge concerning rice. Once rice based demonstrations were working reasonably well, secondary crop, special problem (e.g. rat control), fisheries, animal husbandry and estate crop demonstrations were added to those being conducted by the REC subproject. In many cases these demonstrations were the first of their type to be conducted in the kabupaten and were

considered as trials to see if the demonstration design was able to meet farmer needs and if the field extension staff were able to conduct these new types of demonstrations. Unfortunately, delays in budget approvals, funding and implementation approvals, and implementation planning, many of these one of a kind demonstrations were not repeated. It was intended that the proposed "REC Study Group for Action Planning: the Future of REC" meeting would provide an opportunity to evaluate all types of REC demonstrations, but due to a schedule conflict with the Ministry of Agriculture technical meeting the study group was never convened. Some attempt to systematically evaluate the REC demonstrations should be conducted so that the most successful types of demonstrations can be continued.

REC Subproject Communications

REC Subproject communications activities included the production of pamphlets, booklets and posters, agricultural film presentations, slide productions, procurement and presentations, and some radio broadcasting work. Most of the pamphlets and booklets produced were used to support training activities. Some of these materials were produced by Balai Informasi Pertanian (BIP or Agricultural Information Center), Maros, but most of the booklets were written and duplicated on stencil machines in Luwu by the REC Subproject. Agricultural posters were already being producduced by BIP, Maros and the REC produced posters only to meet local requirements such as to publicize livestock innoculation days.

REC film presentations consisted of REC sponsored visits of BIP's mobile film unit and presentations of films by REC staff using the REC's own equipment. In 1978 the REC subproject purchased a 16mm projector, 7 agricultural films and a portable generator. This equipment was well-maintained and well-used. However, the equipment has been used for 6 years under field conditions and the purchase of a new projector and generator and 11 additional film titles was proposed in 1983. USAID has approved the purchases but to date they have not been approved by BAPPENAS and it is uncertain if the equipment purchases will take place. In addition to the films owned by the REC, films have been borrowed from a number of other sources and a total of 17 titles have been shown at REC presentations. Films presented in a particular area pertained to the agricultural activities or problems in that village and as a result REC film presentations have been extremely popular. It has been found that farmers retain a surprising amount of information from the films. Since the REC subproject began operations in 1978, almost 73,000 persons are estimated to have attended REC subproject film presentations.

Slide equipment (cameras, projectors, a slide-sorting table, etc.) was purchased by the REC Subproject. In addition to the purchase of agricultural slide programs produced by BIP, Ciawi, and the International Rice Research Institute, the REC staff have also produced slide programs geared to specific needs in Luwu.

Slides are used in staff and farmer training programs as well as being presented at the village level.

When the local Luwu radio station was upgraded in 1980, it was anticipated that the REC could assist local agencies in learning to prepare radio broadcasts of special importance to the population of Luwu. Due to problems in planning and problems in maintenance at the local radio station, this work was not begun until 1983, when the REC organized a radio broadcasting workshop taught by staff from Radio Republik Indonesia, Ujung Pandang. Some broadcasts have been prepared and broadcast over the local radio station and the provincial radio station in Ujung Pandang. Those who participated in the workshop developed an interest in radio broadcasting and it is anticipated that this work will be continued when the loan-funded phase of Project Luwu has been completed.

Extension Equipment

Various types of extension equipment have been purchased, mostly from loan funds. In addition to the communications equipment mentioned above, such items as sprayers, hoes, shovels, water quality testing equipment, veterinary equipment, etc. have been purchased. Some of the equipment has been well-used and well maintained. Some of the equipment, especially that at the individual RECs has been poorly maintained and is in a state of disrepair. This situation is in part due staff who feel that it is equipment purchased by the Government and no special effort need be taken to maintain it because it will be replaced. Also, some of the equipment has not been properly maintained because it has been lent to people who have no special interest in maintaining it. A special effort must be made to maintain this equipment. Someone should be assigned the responsibility for maintaining each piece of equipment and that person should be held accountable for it. It is unlikely that funding for replacing broken extension equipment will be made available within the near future.

III. Problems Encountered and Actions Taken

| Problem | Action | Result |
|---|---|---|
| A. Lack of workable, formal orgazitional structure for coordinated extension planning and implementation at local level. | 1. Made higher administrative levels aware of problem and suggested possible soultions.<br>2. Encouraged use of existing formal coordination sturcture.<br>3. Strengthened informal coordintion among agencies. | Requires policy decision at national level. Believe solutions are being sought at proper levels. |
| B. Very weak informal, day to day coordination of extension activities. | 1. PPS & PPM level staff from each sub-sector line agency seconded to REC Subproject.<br>2. Encouraged problem oriented rather than sector/commidity approach to agricultural extension.<br>3. Organized joint training and demonstration activities to promote improved coordination. | Significant improvement in informal coordination and cooperation among sub-sector line agencies. Whole farm approach to farm management extension planning begun with all sub-sector agencies participating. |
| C. Farmer training courses too long, too general with weak practical training component. Farmer retention of course content limited. | 1. Shortened courses and reduced the number of enterprises covered in one course.<br>2. Included strong practical element and use of practical training plots for most courses.<br>3. Oriented courses toward specific geographic and farmer problems. | Significant improvement with high farmer satisfaction being reported from all evaluation sources. Monitoring of adoption still needs to be improved. |
| D. Staff training lecture oriented. Some staff have little practical practical command of what they are teaching farmers. Credibility problems. | 1. Provided transportation, teaching material funds and instructor honorariums for in-service training to increase attendance.<br>2. Introduced stronger practical training element & role-playing techniques in in-service training sessions.<br>3. Field training days at demonstration sites forced field staff to use practical training knowledge in field. | In-service staff training improved but practical element and role-playing techniques still need to be strengthened. Monitoring of staff problems and field performances still weak despite repeated efforts to improve it. |

| | Problem | Actions | Results |
|---|---|---|---|
| E. | Demonstrations started late and potential benefits not being realized. | 1. Checklists for ordering, delivering and using demonstration inputs developed.<br>2. Area specific, farmer problem oriented training days with practical element included in demonstration plans.<br>3. Economic analysis of demonstrations compared to farmer control introduced at demonstration harvest functions. | Delivery of inputs to demonstation sites improved, but checklists not popular. Field training days being conducted at REC demonstrations, but not at other line agency demonstrations. Field training days well attended but extension worker's performance not being monitored by senior REC Subproject staff. Economic analysis popular with farmers but not with field staff. Use of this important tool must be continued. Poster form blank charts for economic analysis of field demonstrations should be printed. |
| F. | REC physical maintenance poor. | 1. Requested increase in GOI maintenance funds.<br>2. Encouraged better use of REC laborers. | Maintenance funds for RECs improved. Maintenance somewhat improved but additional improvements must be made. |
| G. | Maintenance of extension equipment and tools at RECs extremely poor. Very bad example for farmers. | 1. Stressed importance of preventative maintenance.<br>2. Attempted to limit lending or improve conditions of lending equipment.<br>3. Encouraged repair of damaged equipment. | Some improvement in attitude toward equipment use at H.Q. level but still poor at individual RECs. Strong management of equipment use required. Responsibility for condition of equipment at each location must be assigned and enforced. |
| H. | Full use of land surrounding RECs not realized. | 1. Encouraged better use of laborers at RECs.<br>2. Hand tractors made available to RECs.<br>3. Recommended better planning of land use with emphasis on practical training plots.<br>4. Included laborers and area farmers in production sharing at 1 REC. Not yet applied at others. | Some improvement in land use at RECs. More effort to plan so that REC land is used to support purposes of RECs rather than simply for crop production. Better use of REC laborers must be made if land use is to reach a satisfactory level. |

| | Problem | Actions | Results |
|---|---|---|---|
| I. | Water supply systems for staff RECs low in quality or quality. | 1. Produced proposal for imrpovement of water supplies. Proposal approved and funds provided for improvement of water systems at 3 RECs.<br>2. For special case of water at REC Mangkutana see below. | Improved water systems currently being constructed at 3 RECs. |
| J. | REC Mangkuant badly sited on extremely poor soil. Inadequate water supply for crops, livestock and staff. Staff morale low due to those conditions. | 1. Analyzed soil and tried various crops with little sucess except for fodder grass.<br>2. Arranged for Food Crops Research Institute experiements but no viable solution found.<br>3. Arranged to have livestock taken daily to stream 1 km. distant for water.<br>4. Produced proposal for gravity-fed water system which after much delay was approved by USAID. | Soil seems unsuitable for general agriculture, but may be suitable for fodder crops. Lack of records for fodder grass production makes this uncertain. Water system not yet approved by BAPPENAS and costs for gravity-fed system have increased to the point where it cannot be built with funds requested. GOI can still bore a new well with funds requested, but will not be reimbursed by USAID. If suitable water system is not built REC Mangkutana should be closed. |
| K. | Continued problems with budget and implementation approvals. Late arrival of funds severely handicapped rational planning and implementation of extension activities. | 1. Brought problem to attention of Project Luwu Manager and Jakarta offices involved.<br>2. Consultant coordinated with offices and staff involved. | Little improvement made and some important activities cancelled as a result. Most problems involved loan funds and situation should improve when loan funds depleted. |
| L. | Beginning attitude of REC Subproject Staff poor and not oriented toward accomplishing tasks necessary for suitable extension program. | 1. Task-oriented, problem solving approach emphasized.<br>2. Goals set and plans to reach those goal established. | The attitude of the REC Subproject staff in general has been greatly improved. Problems encountered are now either solved or all possible approaches are exhausted. The REC Subproject senior staff are functioning well as an extension team. |

## IV. Accomplishments to date.

It is difficult to measure the accomplishments of agricultural extension programs because the results achieved are often not immediate nor are they attributable to one source. Certainly production increases and increases in farmer income are goals of extension but factors such as input availability, credit availability, and influence of market situations all have an effect on production increases but they are not all within the scope of work usually considered as agricultural extension. The Lappo Ase Rice Intensification project held in Luwu in 1982 was a concentrated effort which utilized the efforts of several agencies to achieve a substantial increase in rice production. The remarkable success of this program demonstrated what could be achieved if all of the necessary concerned agencies worked together in a coordinated, cooperative manner to accomplish a goal. However, the success of the program cannot be attributed to one agency or to any one factor. The figures below provide a broad picture of the accomplishments of the Rural Extension Center Subproject. Only the agricultural enterprises which received the most attention from extension agencies are included in the data, but these cover most of the major activities of Luwu farmers.

Table 4.1 provides some objective measures of the accomplishments of the Rural Extension Center Subproject. The padi yields presented in the table differ somewhat from the total kabupaten-wide yields in that the latter include both upland and lowland rice. However, the yields are comparable in that the the yields reported for area farmers in table 4.1 are only slightly higher than those reported for kabupaten-wide lowland rice (gabah) yields for farmers participating in the BIMAS program. Lowland rice constitutes the largest category of food crop land cultivated in Luwu. Lowland rice (both irrigated and rainfed), has received the most emphasis where extension efforts in Luwu are concerned and the data shows that it is lowland rice which has had the highest average increases (4.4% per year between 1975 and 1982).

The per hectare yields presented in figure 4.1 are an average of REC rice demonstrations and area farmer yields over a 3 year period. Before that time no data for REC demonstrations were kept. Average area farmer yields are the yields reported by farmers whose land was adjacent to the demonstration sites. While the yields may vary from season-to-season due to weather Cand other factors, the demonstrations have averaged 2.46 t/ha higher than area farmer yields. This difference is enough to convince farmers that they can increase their own yields, but not so high that the yields seem beyond the reach of the target farmer group. If the difference between demonstration and farmer yields for the 3 year period are examined on a year-by-year basis, the difference between demonstration yields (6.3 t/ha newly harvested padi) and area farmer yields (3.4 t/ha) in 1981 was 2.9 t/ha. In 1982 the difference was reduced to 2.61 t/ha

Table 4.1

REC SUBPROJECT
TOTAL DEMONSTRATIONS AND FARMER TRAINING

| | ACTIVITY | UNITS | FARMERS TRAINED | MAN-DAYS FARMER TRAINING | FARMERS CONTACTED | AVERAGE DEMONS. YIELD*2 | AVERAGE FARMER YIELD*3 | DIFFERENCE |
|---|---|---|---|---|---|---|---|---|
| I. | GENERAL FARMER TRAINING *1 | 137 | 3035 | 22366 | - | - | - | - |
| II. | RICE PRODUCTION | | | | | T/HA | T/HA | T/HA |
| | 1. Rice Producers Training Courses | 10 | 377 | 912 | - | - | - | - |
| | 2. Rice Production Demonstrations | 78 | - | - | 5329 | 7.07 | 4.61 | 2.46 |
| III. | SECONDARY CROPS (PALAWIJA) | | | | | | | |
| | 1. Maize Producers Training Courses | 8 | 240 | 720 | - | - | - | - |
| | 2. Maize Production Demonstrations | 9 | - | - | 261 | 2.2 | 1.07 | 1.13 |
| | 3. Soyabean Producers Training Courses | 5 | 150 | 450 | - | - | - | - |
| | 4. Soyabean Production Demonstrations | 9 | - | - | 230 | 1.21 | .72 | .49 |
| | 5. Other Demonstrations *4 | 33 | - | - | 1170 | - | - | - |
| | 6. 78/79 DIP Food Crop Demonstrations | 43 | - | - | 1021 | n/a | n/a | n/a |
| IV. | ESTATE CROPS | | | | | KG/PLANT | KG/PLANT | KG/PLANT |
| | 1. Clove Producers Training Courses | 5 | 145 | 655 | - | - | - | - |
| | 2. Clove Production Demonstrations | 16 | - | - | 704 | 3.7 | 2.5 | .8 |
| | 3. Coffee Producers Training Courses | 3 | 90 | 270 | - | - | - | - |
| | 4. Coffee Production Demonstrations | 12 | - | - | 793 | .6 | .27 | .33 |
| | 5. 78/70 Estate Crop Demonstrations | 9 | - | - | 190 | n/a | n/a | n/a |
| V. | ANIMAL HUSBANDRY | | | | | | | |
| | 1. Cattle Producers Training Courses | 7 | 210 | 1110 | - | - | - | - |
| | 2. Cattle Related Demonstrations | 20 | - | - | 664 | - | - | - |
| | 3. Small Animal Producers Training | 2 | 60 | 180 | - | - | - | - |
| | 4. Poultry Producers Training Courses | 2 | 60 | 180 | - | - | - | - |
| | 5. Poultry Production Demonstrations | 11 | - | - | 1099 | 9291 chickens inoculated | | |
| | 6. Inoculation Demonstrations | 30 | - | - | 4978 | 11765 Large animals vaccinate | | |
| | | | | | | 41700 chickens inoculated | | |
| | 7. 78/79 DIP Livestock Demonstrations | 7 | - | - | 232 | - | - | - |
| VI. | FISHERIES | | | | | KG/HA/YR | KG/HA/YR | KG/HA/YR |
| | 1. Brackish Water Prducers Courses | 11 | 318 | 1218 | - | (shrimp) | (shrimp) | (shrimp) |
| | 2. Brackish Water Demonstrations | 6 | - | - | 308 | 160 | none | 160 |
| | | | | | | (milkfish) | (milkfish) | (milkfish) |
| | 3. Freshwater Demonstrations | 7 | - | - | 326 | 513 (carp) | 325 (carp) | 188 (carp) |
| | 4. 78/79 DIP Demonstrations | 20 | - | - | 438 | 982 n/a | 574 n/a | 408 n/a |
| TOTAL DEMONSTRATIONS AND FARMER TRAINING | | 500 | 4685 | 28061 | 17743 | | | |

*1.-Includes Management of Farmer Groups,Farmer Meetings, Field Tours, etc, as well as gen. Farmer Training.
*2.-Rice yields = newly harvested unhulled rice. Maize and soyabeans = shelled,dried yield. 3. Average farmer yields reported by farmers from areas around demonstrations. All yields 1981-83 only. n/a = not available.

Figure 4,2

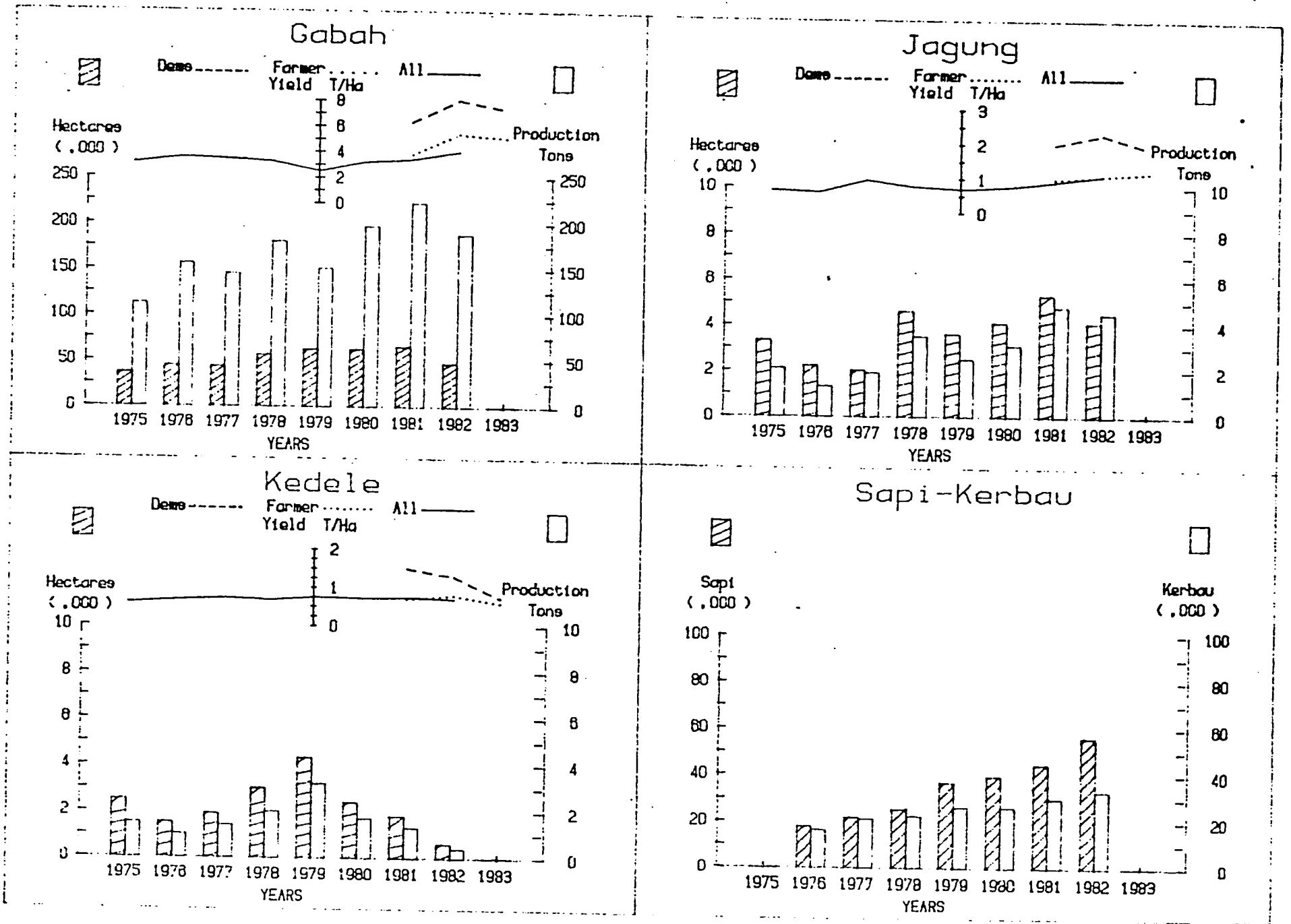
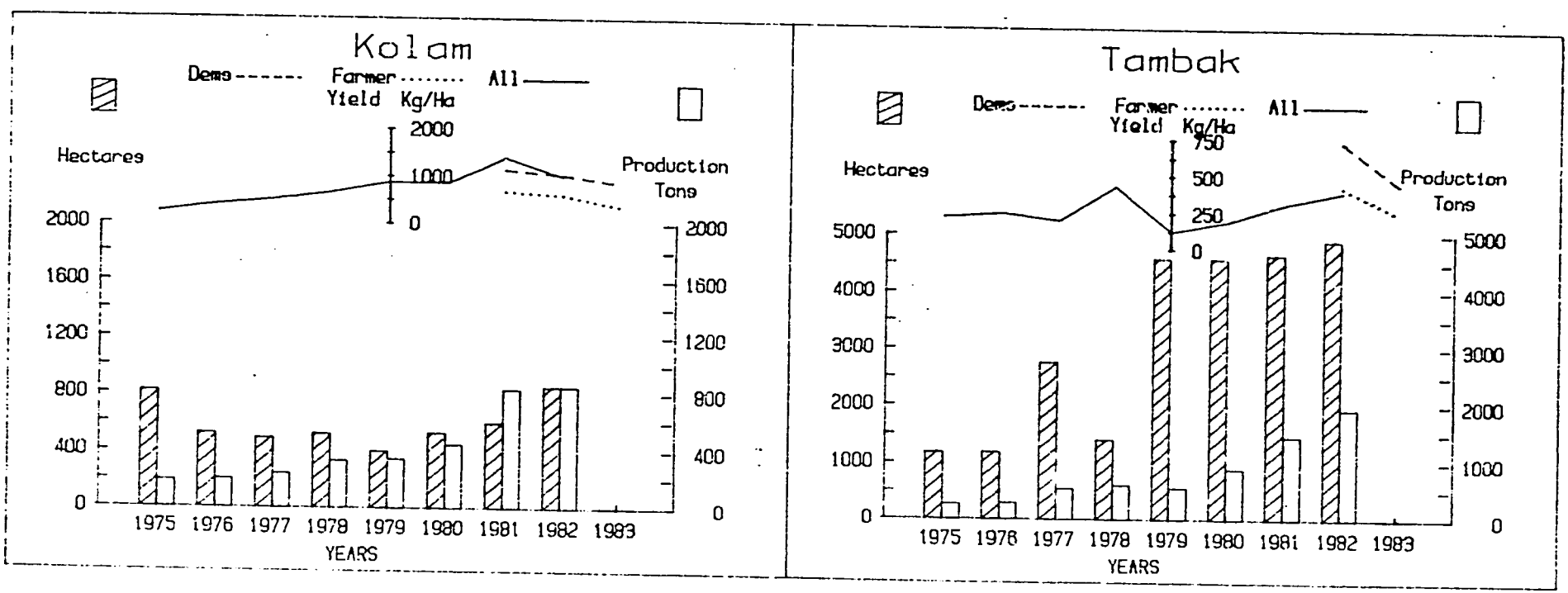

Gabah
Demo
Farmer
All
Yield T/Ha
Hectares (.000)
Production Tons
YEARS
1975 1976 1977 1978 1979 1980 1981 1982 1983
Jagung
Demo
Farmer
All
Yield T/Ha
Hectares (.000)
Production Tons
YEARS
1975 1976 1977 1978 1979 1980 1981 1982 1983
Kedele
Demo
Farmer
All
Yield T/Ha
Hectares (.000)
Production Tons
YEARS
1975 1976 1977 1978 1979 1980 1981 1982 1983
Sapi-Kerbau
Sapi (.000)
Kerbau (.000)
YEARS
1975 1976 1977 1978 1979 1980 1981 1982 1983

Figure 4.3


Kolam
Dems
Farmer
All
Yield Kg/Ha
2000
1000
0
Hectares
Production
Tons
2000
1600
1200
800
400
0
1975 1976 1977 1978 1979 1980 1981 1982 1983
YEARS
Tambak
Dems
Farmer
All
Yield Kg/Ha
750
500
250
0
Hectares
Production
Tons
5000
4000
3000
2000
1000
0
1975 1976 1977 1978 1979 1980 1981 1982 1983
YEARS

and by 1983 the difference had decreased to 2.27 t/ha. This would indicate that Luwu farmers were using the technology being demonstrated and as a result their yields were gradually approaching those obtained on the demonstration plots.

The top portion of the first 3 graphs in figure 4.2 compares REC demonstration, area farmer and kabupaten-wide yields for the 3 major food crops selected for special extension program emphasis in Luwu. The bottom portion of the graphs shows the total hectares harvested and total production in Luwu. Food crop production decreased in 1982 and 1983 due to the effects of a drought and the effects of the world recession.

Table 4.1 indicates that REC subproject maize demonstration yields (2.2 t/ha dried, shelled maize) averaged a little more than double the average yield (1.07 t/ha) reported by farmers whose land surrounded the demonstration sites. When considered on a kabupaten-wide basis, maize per hectare yields in 1982 (.91 t/ha) show an increase of about 44% over the 1975 yields (.64 t/ha) and total maize production in 1982 (4,500 metric tons) was more than twice the 1975 production (2,100 metric tons). Maize production decreased in 1982 (see Jagung-table 4.2) as a result of a drought which occured in the latter part of that year. Most of the increases in maize production have been absorbed within the kabupaten either through increased consumption or through use in animal feeds.

The top portions of figures 4.2 and 4.3 shows a comparison of the average (mean) yields (by year) from REC demonstrations, yields reported by farmers from the areas surrounding demonstration sites and the yields for Luwu as a whole (production divided by hectares harvested). The farmer and demonstration yields shown for kedele (soyabeans) are somewhat misleading because of the somewhat small numbers of demonstrations involved, especially in 1983 when only one soyabean demonstration was involved.

Soyabean production in Luwu decreased from 1,500 metric tons in 1975 to only about 400 metric tons in 1982 despite a 28% increase in per hectare yields between 1975 (.58 t/ha dried, shelled soyabeans) and 1981 (.74 t/ha). REC demonstration yields (1.21 t/ha) averaged about 70% (.72 t/ha) higher than those obtained by area farmers. Soyabeans continue to be a high-risk crop in Luwu due to poor yields, poor market conditions and a high failure rate. The bottom of the kedele graph in figure 4.2 demonstrates the substantial decrease in soyabean production. The RECs did some demonstration work (e.g. crop rotation,home garden etc) with other food crops but on a more limited scale than rice maize and soyabeans.

REC estate crop demonstration and training activities were delayed due to problems with budget and implementation approvals (among other problems) and the 1980/81 and 1982/83 budget year activities were conducted in the late 1982 and 1983 calendar years. However these activities were conducted in kecamatans

with high concentrations of clove and coffee growers and may prove to have a significant impact in the near future. Due to inaccurate data, it was not possible to construct a graph for estate crops in figure 4.2.

Due mostly to poor planning REC fisheries activities were also late getting started, but once begun they have been quite successful. Fisheries projects conducted in cooperation with the Luwu Office of Fisheries, the Farmer Cooperative Center Subproject and other credit agencies show much promise in helping Luwu fish farmers realize the substantial potential (especially for shrimp production) for inland fisheries in Luwu. Table 4.3 compares yields, area and production for the major fisheries activities in Luwu. The area currently developed for brackish water fishponds shown in the graph (Tambak) does not include an additional 4,000 hectares which are being developed in Luwu, but which have not yet gone into production. Reports from brackish water demonstrations do not clarify the reason that the demonstrations and area farmer yields declined between 1982 and 1983. The reason that demonstration yields obtained from freshwater ponds (kolam) were lower than the average yields for all Luwu ponds was also not made clear in the reports.

One of the major accomplishments of the REC Subproject in increasing cooperation and coordination among the development agencies in Luwu has been the REC/Office of Animal Husbandry/Office of Food Crops poultry and livestock inoculation program. The major problem which confronted Luwu poultry and livestock production has been the high mortality rate caused by disease (New Castle Disease, Haemogoric Septiceima, and Anthrax). Due to very limited manpower and a shortage of funds for transportation, the Luwu Office of Animal Husbandry was having difficulties conducting a widespread poultry/livestock inoculation program in Luwu. Through the efforts of the REC Subproject an arrangement was made whereby Food Crop field extension workers were taught to administer inoculations and it is anticipated that the numbers of poultry and livestock protected against disease will increase substantially as soon as the national shortage of vaccine is overcome.

The Office of Food Crops provided the much needed manpower, the RECs provided funds for hypodermic needles and syringes and for training and the Office of Animal Husbandry provided instruction and vaccines. To date about 50,000 chickens and 12,000 large animals have been inoculated under REC sponsored programs. It is anticipated that an increased supply of vaccines in 1984 will bring a marked increase in the numbers of poultry and livestock inoculations and a concommitant decrease in livestock mortality in Luwu. The dramatic increase in bovine animal population in Luwu during Project Luwu is shown in the graph in figure 4.2.

Other REC subproject animal husbandry activities have included fodder grass demonstrations, poultry inoculation demonstrations, chick production demonstrations, duck production demo-

nstrations, compost demonstrations, and farmer training courses for beef cattle producers, swine producers, poultry producers, and goat producers. Total farmer contacts to date from all REC subproject activities (excluding the approximately 72,000 persons who attended slide and film presentations) are estimated at 22,5000 (4,685 farmers attended formal training courses and a reported 17,743 farmers were attended field training days at REC demonstrations). This figure represents 249% of the target set in 1980.

REC Subproject Goal Achievements.

Looking at the success of the REC Subproject in reaching the goals set out in the Capital Assistance Paper (see pages 2 and 3 of this report) it can be seen that the RECs have sucessfully reached the goals set for them. Although the RECs have never been centers where large numbers of farmers come daily to seek solutions to problems, the RECs have become centers for the dissemination of agricultural information in that most knowledge is extended to farmers through PPL field visits, farmer training courses, the REC communications program, etc. The RECs are the center from which most of these extension activities are conducted. REC staff also organize farmer meetings where recommended solutions to farmer problems are discussed in addition to the fact that farmers and staff have a chance to discover the kinds of problems faced by Luwu farmers and the kinds of extension programs the farmers themselves feel would be useful to them.

Field trials, although conducted on a limited scale, have not been a primary focus at the RECs because of the program for cropping research conducted by the Institute for Food Crops Research, Maros, from loan funds. This research was not envisioned in the CAP when the project was designed, but the research trials conducted under the loan-funded research effort and normal field trials conducted by the Office of Food Crops and the FAO would have made any field trials by the REC redundant, except in special instances. Although the farmyards at REC Batusitanduk and REC Mangkutana are not being fully utilized at this time, the area planted at each REC, demonstration site and training plot are designed to implement good farming practices as examples for Luwu farmers.

In 1975 there were few farmers who were organized into farmer groups. As of the end of the 1981/1982 planting season some 890 farmer groups had been organized and 833 contact farmers were identified and were receiving regular visits from field extension workers in Luwu. Additional special interest groups (e.g. brackish water fish producers, women farmer groups, etc.) have been organized but the number of such groups is not available at this time.

In addition to organizing farmer groups the RECs were to have organized and implemented training sessions. To date 4,685 Luwu farmers have attended 190 formal farmer training courses conduct-

ed by the RECs and have received a total of 28,061 man-days of farmer training. A breakdown of the kinds of farmer training activities is given in table 4.1. An additional 17,743 farmers have visited REC conducted demonstrations and most of these have received training at the demonstration sites. The major categories of demonstrations by type and the numbers of each type of demonstration cconducted are listed in figure 4.1. Bi-weekly, in-service training sessions have been held for field extension staff from the Office of Food Crops from very early in the life of the project. Special in-service training courses were conducted for field extension staff from the Offices of Estate Crops, Fisheries, and Animal Husbandry. Additional staff training courses were held for PPLs working with transmigration farmers and several general staff workshops were held both in Luwu and at the Agricultural Staff Training Center, Batang Kuluku, South Sulawesi. The Whole Farm Management Training Course for senior technical staff has been mentioned above. In addition to formal staff training exercises there have been numerous staff meetings where problems and solutions to those problems have been discussed.

In addition to the above requirements specified in the Capital Assistance Paper (see page 3 of this report) the RECs were to have developed a program for irrigated farming. This program has been confined to irrigated rice due in part to irrigation system design, a lack of available research and especially to farmer preference. The RECs have conducted a substantial portion of staff technical training geared toward improving irrigated rice production. All of the rice production demonstrations conducted in areas where irrigation was available were conducted on irrigated plots. In addition all of the rice production training courses included elements on irrigated farming.

One of the specific tasks assigned to the REC Subproject was to encourage the use of high-yielding and disease resistant rice varieties in Luwu. It was reported that in 1975 less than 10% of the farmers surveyed in the N. Luwu Micro-Economic study were using high-yielding rice varieties or fertilizers and that virtually no farmers were using disease resistant varieties. The latest data (1982) avialable from the RECs reported that 77.6% of all Luwu farmers were using high-yielding/disease resistant varieties according to recommendations. It was also reported that for the same period 46.8% of all Luwu farmers were using fertilizers according to recommemded dosages. Those figures do not include farmers using small amounts of fertilizer on their crops.

Upland cropping improvements were directed mostly toward secondary crops (palawija) and estate crops (coffee and cloves). Activities with maize have been sucessful in that maize production in Luwu increased from 2,100 tons in 1975 to 4,800 tons in 1981, then dropped to 4,500 tons in the dry year of 1982. Eight training courses for maize producers and 9 maize only demonstrations were conducted during the project. Maize production was also demonstrated in home garden and crop rotation demonstra-

tions.

Although attempts to improve soyabean production were undertaken, they met with little success in that soyabean production in Luwu had declined from 1,500 tons in 1975 to 400 tons in 1982. Poor markets, low yields, and a lack of available research during the loan funded portion of the project were all contributing factors to the decline in the production of soyabeans in Luwu. Soyabean yields have been consistantly low in Luwu even in research plots. If increased soyabean production is a serious goal for agricultural development in Luwu additional research will be necessary to find how to improve per hectare yields. It will also be necessary to establish a seed production and storage program as the rather fast reduction in seed germination viability has led to frequent shortages of seed, especially for improved varieties. If serious efforts are made to improve soyabean production a marketing study must be conducted to identify markets and to improve market timing to take advantage of higher prices in other parts of Indonesia. Transport costs and the effects of imports on prices will be important factors in determining any recommendation for farmers willing to produce soyabeans in Luwu.

Any improvement in the coffee production situation in Luwu will also depend very much on marketing considerations. Even ignoring the fluctuations in the world coffee market, the poor quality of Luwu coffee, and the consequent low farmgate prices paid to farmers will continue to hamper efforts toward any sizable increases in coffee production. Preliminary information indicates that buyers are unwilling to pay enough of a premium for better quality coffee. If this situation continues, there is little incentive for the Luwu coffee grower to improve the quality of his product.

Even though the there appear to be some problems with data for clove production avialable from BAPPEDA it is clear from travelling around Kabupaten Luwu and surrounding areas that a tremendous amount of new clove gardens are being planted. REC Subproject demonstrations have shown that production from existing gardens can be also be substantially increased. Many Luwu farmers seem to regard cloves as something which they can rely on for income when they are retired. Many others regard cloves as an important future source of savings. It would seem that the consequences of overproduction would be extremely serious.

Information should be collected on a nation-wide basis to allow the projections of the supply/demand situation for cloves. If it appears that there is a danger of overproduction consideration should be given to eliminating inducements to increasing clove production such as credit programs and demonstrations geared toward increasing production.

Overall Project Luwu Accomplishments - It is difficult to measure the accomplishments of the REC Subproject without looking at the goals set out in the CAP and at the progress made toward

those goals during the Luwu Project.The goals set out in the Capital Assistance Paper are listed on pages 3 and 4 of this report. The measures of goal achievement presented in figure 4.4 and figure 4.5 are the same as those used previously in Checchi and Company's annual reports. Growth rates have been developed using regression analysis (the method used is described in detail in the Checchi "Evaluation Study for Project Luwu," February, 1980). Measures of goal achievement are the annual growth rates of:

1. Food Farm Population.
2. Hectares harvested per food farm person.
3. Purchased agricultural inputs.
4. Food Production.
5. Food Exports.
6. Food Consumption per capita.
7. Net income per food farm person.
8. Bank credit.

For the purposes of this paper, it is not necessary to examine in detail all of these measures of goal achievement. However, it is important to remember that the world recession and the drought in Luwu during late 1982 and early 1983 have caused distortions in the goal achievement trends for the entire project period. Where sharp declines had a severe effect on the measures of goal achievement the data are presented in more detail. In figures 4.4 and 4.5 progress growth rates from GOI fiscal years 1975/76 to 1982/83 (i.e. the years Porject Luwu was implemented) are compared to pre-project baseline fiscal years 1970/71 to 1975/76. Trends are also comparable over different geographic areas to observe the differences between project and non-project areas. These are:

1. Kabupaten Luwu as a whole.
2. Primary Project area - Kecamatans Bone-Bone, Wotu, and Mangkutana.
3. Palopo Headquarters area - Kecamatans Wara (Palopo), Walenrang, and Bua Ponrang.
4. Other Kecamatans.

These geographic areas are shown in figure 4.6.

Due to revisied population estimates just made available last year, the growth rate estimates for food farm population for the progress period (i.e.project period -1975/76 to 1982/83) are lower than for the baseline period. Total population growth for Luwu during the progress years is estimated at 4.8%, but food farm population growth for the same period is estimated at only 3.3%. Annual growth in the primary project area for the progress years is estimated at 5.5%. This would, to some extent, reflect the attractions of the irrigation projects, land clearing projects and the in-migration of transmigrants and others due to improved roads, services, etc.

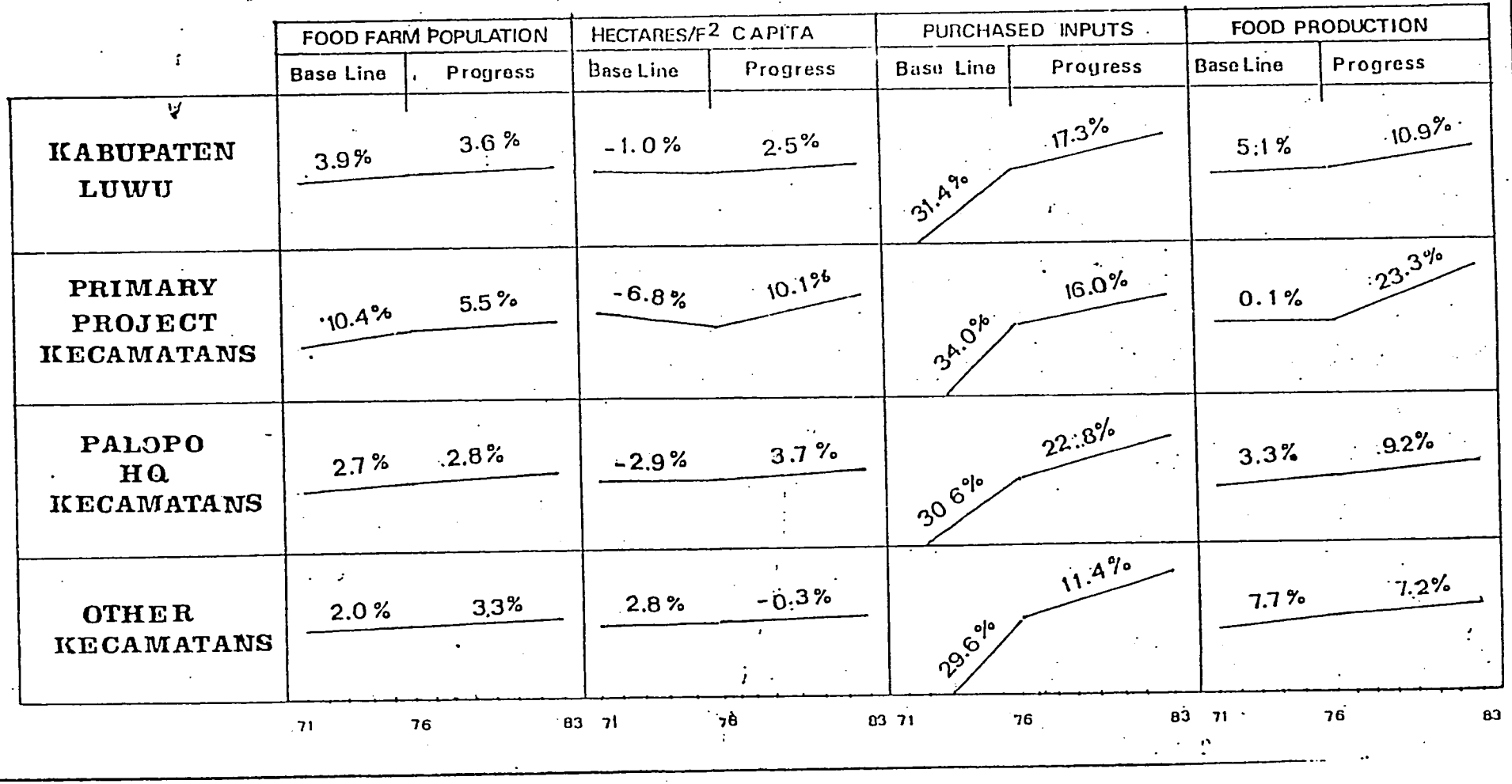
The progress for hectares harvested per food farm person has

# GOAL PROGRESS ESTIMATES

Figure 4.4

## BY GROWTH RATES %

1970-71 to 1981-83



# GOAL PROGRESS ESTIMATES
## BY GROWTH RATES %
1970 – 71 to 1981–83

Figure 4,5

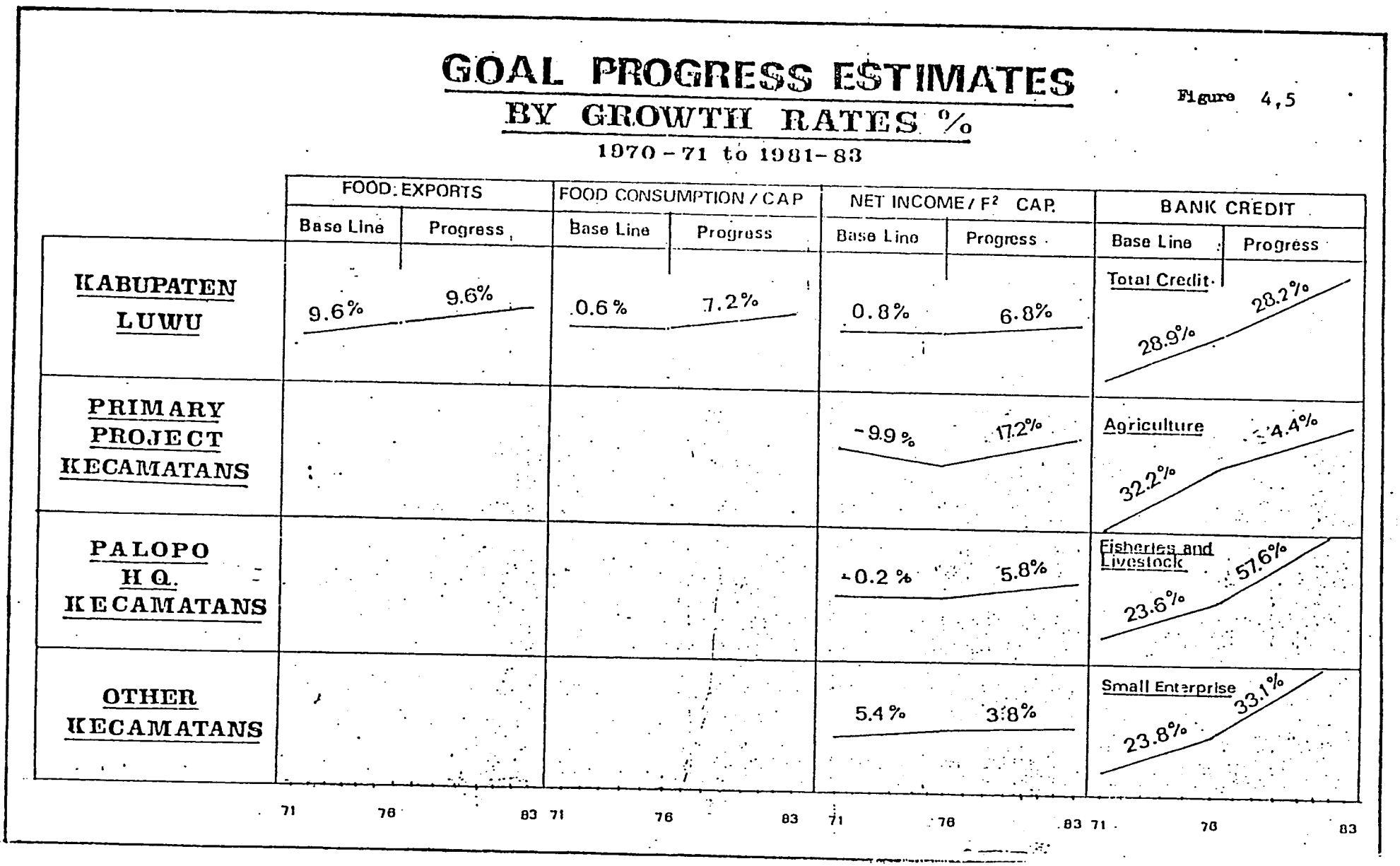


Figure 4.6

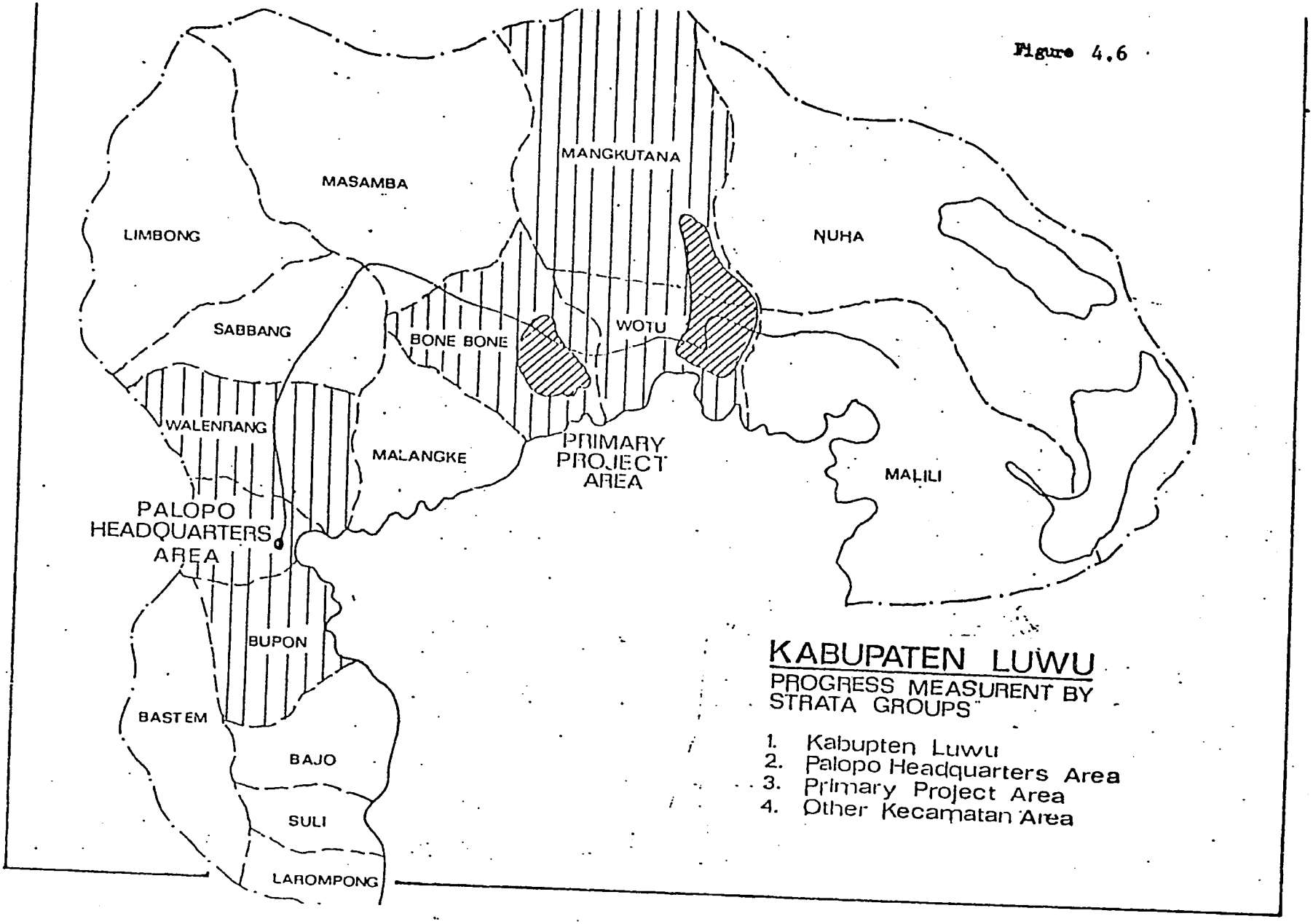

MANGKUTANA
MASAMBA
LIMBONG
NUHA
SABBANG
BONE BONE
WOTU
WALENRANG
MALANGKE
PRIMARY PROJECT AREA
MALILI
PALOPO HEADQUARTERS AREA
BUPON
BASTEM
BAJO
SULI
LAROMPONG
KABUPATEN LUWU
PROGRESS MEASURENT BY STRATA GROUPS
1. Kabupten Luwu
2. Palopo Headquarters Area
3. Primary Project Area
4. Other Kecamatan Area

Table 4.7
Production of Food Crops
in Thousand Tons
1975-1982

| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|
| Rice (Paddy) | 111.7 | 156.2 | 145.1 | 180.3 | 151.2 | 196.9 | 221.5 | 187.6 |
| Maize | 2.1 | 1.3 | 2.0 | 3.5 | 2.5 | 3.1 | 4.8 | 4.5 |
| Cassava | 12.5 | 7.4 | 9.3 | 8.6 | 7.6 | 7.7 | 11.7 | 7.7 |
| Sweet Potatoes | 4.6 | 3.5 | 4.8 | 3.5 | 4.1 | 4.0 | 2.9 | 2.9 |
| Ground Nuts | 0.5 | 0.4 | 0.8 | 1.2 | 1.5 | 1.9 | 0.5 | 0.3 |
| Soybeans | 1.5 | 1.0 | 1.4 | 2.0 | 3.2 | 1.6 | 1.3 | 0.4 |
| Mung Beans | 0.1 | 0.1 | 0.1 | 0.1 | 0.2 | 0.2 | 0.5 | 0.2 |
| Fruit | 0.5 | 0.3 | 0.2 | 0.6 | 9.8 | 8.9 | 10.7 | 11.8 |
| Vegetables | 2.1 | 1.8 | 3.7 | 5.9 | 3.7 | 4.8 | 3.7 | 3.5 |
| Total | 135.6 | 172.0 | 167.4 | 205.7 | 183.8 | 229.1 | 257.6 | 218.9 |

SOURCE: Bappeda.

Table 4.8
Hectares of Food Crops Harvested
in Thousands
1975-1982

| | 1975 | 1976 | 1977 | 1978 | 1979 | 1980 | 1981 | 1982 |
|---|---|---|---|---|---|---|---|---|
| Rice (Paddy) | 35.7 | 43.2 | 43.4 | 58.4 | 61.7 | 62.4 | 65.1 | 47.2 |
| Maize | 3.3 | 2.2 | 3.3 | 4.6 | 3.6 | 4.1 | 5.2 | 4.1 |
| Cassava | 2.2 | 1.4 | 1.6 | 1.7 | 1.8 | 1.4 | 1.8 | 1.0 |
| Sweet Potatoes | 1.1 | 0.9 | 1.0 | 0.9 | 1.0 | 0.9 | 0.7 | 0.6 |
| Ground Nuts | 0.9 | 0.6 | 1.2 | 1.9 | 2.0 | 2.9 | 0.9 | 0.4 |
| Soybeans | 2.5 | 1.5 | 1.9 | 3.0 | 4.3 | 2.4 | 1.8 | 0.6 |
| Mung Beans | 0.3 | 0.1 | 0.3 | 0.2 | 0.3 | 0.4 | 0.7 | 0.3 |
| Vegetables | 0.5 | 0.5 | 0.7 | 0.8 | 1.6 | 2.5 | 2.2 | 2.1 |
| Total | 46.5 | 50.4 | 53.4 | 71.5 | 76.3 | 77.0 | 78.4 | 56.3 |

SOURCE: Bappeda.

shown only modest annual growth (2.5%) for the entire kabupaten for the progress years. This is due, in some part to the decline from 19,781 food farm hectares harvested in 1980/81 to 14,470 in 1982/83. The drought is to some extent the cause of this sizable decrease.

The Other Kecamatans show the lowest annual growth rate for hectares harvested per food farm person. The primary project area annual growth estimate of 10.1% was the highest for the progress years growth in the Kabupaten. This is what might be expected when the project investment in irrigation, extension activities and the improvement of inputs purchases (especially pesticides used for crop protection against pests) are considered.

The value of purchases of food farm inputs (i.e. fertilizers, pesticides, seed, tools, tractor rental, fuel for tractors and land taxes) in Luwu declined drastically in the 82/83 fiscal year. The decline was caused by the fact that most of the inputs for the Lappo Ase program were purchased in the 81/82 fiscal year. It is also felt that the drought in 1982 had an effect on the willingness of farmers to purchase inputs. Whatever the case, input purchases dropped some 40% (from Rp. 740 million to Rp. 440 million) between the 1981/82 and the 1982/83 fiscal years. The 1982/83 input purchases level in the kabupaten fell to the 1980/81 level, and the baseline years show an annual progress rate (31%) which was higher than growth rate of 17.3% for the project period. The project area had the highest yearly growth rate (27.8%) in Luwu during the project years due to the fact that the two Farmer Cooperative Centers which have functioned the longest were both located within the project area.

The value of food production (calculated in 1978 Rupiah) decreased 14% during the 1982/83 fiscal year. On the whole, the value of food production in Kabupaten Luwu increased from an annual growth rate of 5.1% during the baseline years to a annual rate of 10.9% during the project period (76/76 to 82/83). The annual food production growth rate for the primary project area during the project years was 23.3%, a substantial increase from annual growth rate of 0.1% reported during the baseline years.

Rice producton showed almost no growth during the baseline years. However, during the progress years rice production increased at a rate of 9.6% per year. The investment in the primary project area appears to have paid off in that an increase in rice production was a healthy 31.8% yearly during the progress years. During the same period the value of food consumption per capita in Luwu increased at an annual rate of 7.3% per year (as opposed to an annual rate of 0.6% during the baseline years) and food exports from Luwu increased at an average annual rate of 9.6% per year.

The annual average growth rate for food exports from Luwu was equal (9.6%) during the baseline and progress years. Food ex-

ports had decreased between 1980/81 and 1981/82, but rice (beras) exports increased during the same period. Exports of corn, soyabeans, durian, cattle, pigs and eggs declined during the 80/81 to 81/82 period. Since soyabean production has declined substantially during the progress years, and the data show that the production of maize, cattle pigs and eggs all increased, it would appear that food exports declined because the Luwu consumption of those products have increased during the period. Hence, exports declined because more food products were being consumed in Luwu and less was aviailable to export to other areas. This is borne out empirically by the increased consumption of corn for animal feed during the period. Also, it seems clear that consumption should rise with the high rate of population growth shown during the project period.

Net income per food farm person increased at an annual rate of 6.8% (in terms of constant 1978 Rupiah) during the project years. The same figure had remained almost stagnant at 0.6% during the baseline years. Net income per food farm person declined from Rp. 53,700 to 43,780 per person between 1981/82 and 1982/83. This means that a family of 5 in Luwu had an income of about Rp. 220,000 during the 1982/83 fiscal year. Once again, the largest annual increase in net income per food farm person was in the primary project area with an annual increase of 17.2 % per year.

Net cash income per food farm person in Luwu increased at an annual rate of 9.5% during the project years (77/78 to 82/83). Cash income is now estimated at Rp. 11,470 per person or Rp. 57,350 (in 1978 Rupiah) for a family of 5 persons. This indicates that the CAP goal of increasing cash income and decreasing farmer dependence on subsistance farming is being met.

The goal set in Capital Assistance Paper was for an increase to $135 in farm food income per family by the end of the project. Food farm income per family was $202 during the last reporting period (1982/83 GOI fiscal year) before the project ended in December, 1983. That target was exceeded by 67%. The gross domestic product per capita in 1982/83 was $312 which is more than 3 times the figure for the 1975/76 benchmark year. It is significant to note that the portion of the gross domestic product that is retained in Luwu increased from 50% in 1975/76 to 59% in 1982/83.

## V. Lessons Learned and Recommendations.

The major lesson learned from the loan-funded protion of the Rural Extension Center Subproject has been that some degree of coordination of agricultural extension services can be achieved, even without a functioning organizational structure for coordination at the kabupaten level. Key elements to improve extension coordination at the local level are: that the effort should be organizationally outside the 4 principle agricultural sub-sector line agencies (the Offices of Food Crops, Estate Crops, Animal

Husbandry and Fisheries) and that higher level technological staff (i.e. university graduate, PPS-level Subject Matter Specialists) must work together at a central location.

It is strongly recommended that a workable program for the improvement of agricultural development planning and/or extension planning be included in the organizational structure of the Ministry of Agriculture. An important consideration is that the head of any body assigned the responsibility for improving coordination should be selected from outside the 4 principle sub-sector line agencies within the Ministry of Agriculture in order to avoid any charges of favoritism. Another important consideration is that senior level technological staff should be encouraged to work together by locating their work places in one central office. Funding for programs which would require mutual effort for planning an implementing coordinated extension projects should be provided to further enhance the progress toward coordinated activities.

There are 3 basic approaches to establishing a mechanism for improving coordination in the planning and implementation of agricultural development at the kabupaten level. 1. An office of Agricultural Development Planning which is administratively above the 4 major sub-sector agencies could be established. Such an office would have the power to plan, monitor implementation and evaluate all agricultural programs within the kabupaten. The head of the office would report to the Provincial Kanwil for Agriculture. At a minimum the responsibility for approving the budget plans for agricultural development should be given to this office. This approach is admittedly somewhat idealistic at this time and the establishment of such an office could cause friction between sub-sector agencies. This approach would also entail the expense of establishing still another agricultural agency. However, this solution could be workable as the increased importance of coordinating agricultural development is recognized in the future. 2. An office similar to the Provincial Agricultural Kanwil could be established at the kabupaten level to carry out the responsibilities of planning agricultural development. This solution is more practical as it involves extending an already existing provincial organizational feature to the kabupaten level, but it still might involve the expense of establishing a new agricultural office. 3. Responsibility for improving agricultural development in general could be mandated to an agency outside the agricultural sub-sector agencies (e.g. the Offices of Food Crops, Estate Crops, Animal Husbandry and Fisheries) so that charges of favoritism can be avoided.

A fourth approach, one which would attempt to improve the coordination of agricultural extension only, using the existing structure would be to upgrade the FKPPs (Forum Koordinasi Penyuluhan Pertanian). At present (at least in Luwu) the FKPP consists of the Directors of the kabupaten level sub-sector line agencies under the Ministry of Agriculture who are to meet monthly as a concensus group to coordinate agricultural extension.

The leader of the group in Luwu is the senior man in terms of length of service, although in other kabupatens leadership may be based on the most predominate agricultural activity in the kabupaten. There is no mandate, no specific program and no budget for conducting coordinated extension activities. As a result, the FKPP in Luwu seldom meets and has produced no substantive decisions. The FKPPs could be improved in the following ways: 1. clearly outline the function of the group and (possibly) assign task oriented responsibilities; 2. provide funding for FKPP meetings and for special programs (e.g. staff training) designed to improve extension coordination (the programs should be flexible enough to allow maximum possible input at the local level); 3. provide funding for an FKPP staff (e.g. a secretary to provide clerical duties); 4. require that reports be produced which would contain brief outlines of matters discussed and decisions reached; and 4. include representatives of Local Government (at a minimum the Bupati or his representative and a representative from BAPPEDA Tingkat II). It would also be highly desirable to include farmer representatives if a suitable selection procedure could be worked out.

No matter what approach is devised for improving agricultural development or extension coordination, point four (above) is extremely important. The head of the kabupaten level Local Government (i.e. the Bupati) must support the program and function actively in the coordination work. Other important key factors are provincial support of the program, funding, for meetings and activities and a mechanism for involving sub-director level (PPS and PPM level) support for the program. Much of the significant progress toward extension coordination achieved in Luwu was achieved at the sub-director senior staff level. The simple fact of having senior staff from different sub-sector line agencies in day-to-day contact in one location (i.e. office) had a tremendous impact on improving the spirit for coordination necessary to obtain coordination are that the effort should be organizationally located outside the 4 principal agricultural sub-sector line agencies (i.e. the Offices of Food Crops, Fisheries, Animal Husbandry and Estate Crops) and that higher level technological (PPS-level) staff must work as a unit in a central location. It is still important that a workable mechanism for the improvement of agricultural planning and extension planning at the kabupaten level be included in the organizational structure of the Ministry of Agriculture. Whatever the mechanism for achieving this, it is clear that the mechanism and the person who heads the effort must be located outside of the 4 main agricultural sub-sector line agencies. Senior technical (PPS-level) staff should be provided with programs which encourage coordination and they should work together on planning coordinated programs from a central office.

Another major lesson learned from the REC Subproject is that the most important tool for improving the performance of field extension workers is a coordinated effort for improving the planning and implementation of a viable bi-weekly, in-service

staff training program. Such a program should be time-oriented toward activities which are being conducted in the field at a given time and toward the most important problems (selected from a prioritized list established from farmer, extension worker and senior staff input) from any particular geographic area. The in-service training program must have a strong practical training element and should be backed by a special budget so that those people attending the training sessions do not bear the burden of out-of-pocket travel and consumption expenses. Simply stated, any financial considerations connected with the in-service training should be geared toward encouraging participants to attend and not toward discouraging them from attending.

It is recommended that the RECs throughout Indonesia be used to improve the coordination of agricultural extension through their training and extension monitoring functions. This recommendation is based on the understanding that the process of monitoring extension activities will be improved within the near future.

It remains to be seen the degree to which REC sub-project loan funding for activities specifically aimed at improving coordination had an effect on the improvement of coordination, but it is important to note that exactly the same positive results could be achieved if funding is provided by the GOI. It is recommended that the REC Subproject Demonstration System, with its series of field training days and problem oriented approach, be expanded to the other RECs and field demonstration activities in Indonesia. It is further recommended that the REC Subproject system for in-service staff training also be expanded to the other RECs throughout Indonesia.

Sincere efforts should be made to establish training plots at each REC where the major crops from that area are made availablle at key stages during the cultivation cycle so that they can be used for practical staff and farmer training exercises. The goal of maintaining agricultural enterprises at RECs should not be simply for production but to establish the RECs as tools for staff and farmer training.

The administrative and supervisory burden of senior technical staff (PPSs) must be reduced so that people in these crucial positions can devote more of their time to field duties. The transfer of research findings and other aspects of staff technical training are the responsibility of PPSs, and are extremely important functions in any extension system. PPSs must be freed from excessive supervisory and administrative duties so that they can perform the functions which they were trained for. One way to achieve this would be to provide PPSs with assistants who could take over some of the time-consuming routine burdens such as preparing reports.

A workable water system must be constructed at REC Mangkutana. If BAPPENAS approves the Rp 4,679,000 proposal which

has been already submitted a suitable well should be bored using those funds. Because it is a waste of funds keeping it open without a proper water supply and especially because of the extreme negative effect on the staff posted there, if funding for a suitable water system is not forthcoming, REC Mangkutana should be closed.

Because general agriculture has proved to be not feasible at REC Mangkutana and in that it does not seem feasible to engage in a long program of green and animal manuring to improve the soil there, the farmyard should be used for the production of fodder grasses. Production records of the fodder grass grown and the weight gains of cattle fed from the fodder grasses must be kept so that an objective assesment of the economic feasibility of producing fodder grasses for animal feed can be made. If the records are not kept, REC Mangkutana will become one more poorly run cattle production enterprise in the North Luwu area. Even then it would be at a competitive disadvantage because before the cattle at the REC can be sold authority must be provided from the Minister of Finance (ANGGARAN). Additional land suitable for general agriculture should be purchased at a suitable site as close to the REC as possible so that training functions can be conducted properly.

IV. Outlook and Requirements for Kabupaten Luwu.

Until September, 1983, the future of the REC Sub-project was very much in doubt. BPLPP has now funded the subproject for the 1983/84 and the 1984/85 fiscal years. The level of field activities in those budgets will be at a reduced rate and no solution to funding activities outside of the transmigration areas has been reflected in the budgets. The REC Subproject had planned a 3 day meeting of the "Study Group for Action Planning: The Future of the REC Sub-project", but a technical meeting called by the Ministry of Agriculture conflicted with the scheduling and the meeting was cancelled. There was no other opportunity for provincial and national figures to work out a detailed evaluation of the REC Sub-project activities and to produce in-depth recommendations for the future of the sub-project.

According to the BPLPP representative who attended the evaluation and recommendation meeting for Project Luwu during November, 1983, the RECs are to continue in approximately the same form except that BPLPP will provide funding only for the day-to-day operations while the funding for special activities will be provided from other agricultural sub-sector agencies. It may be possible to operate the RECs in this manner in that recently appointed persons to fill the newly created position of Director of Extension at each sub-sector agency are from BPLPP. It is within the scope of work of the Directors of Extension to plan programs and to some extent budgets. Luwu still requires improvements in the coordination of agricultural extension, but the spirit of working together has already been established. One hopeful sign that coordination will continue to improve is the

positive attitude of those participating in the Farm Management Training Group. The extension staff in Luwu have the knowledge to conduct a sound program. If their efforts receive continued support, the outlook for agricultural extension in Luwu appear to be good.